

TED03 – (Part E6) Water Treatment

Name _____

1. E.6.1 List the primary pollutants found in waste water and identify their sources. (2) *Examples include heavy metals, pesticides, dioxins, polychlorinated biphenyls (PCBs), organic matter, nitrates and phosphates. Aim 7: Data banks and spreadsheets can be used.*
- a. Using examples explain how is the sun the driving force behind the water cycle?

	Describe	Example
Point Sources		
Non-Point Sources		

- b. What are the primary pollutants in waste water?
- c. BE SURE TO STUDY THE VARIOUS POLLUTANTS (Heavy Metals, Pesticides, Chemical wastes, etc)
2. E.6.2 Outline the primary, secondary and tertiary stages of waste water treatment, and state the substance that is removed during each stage. (2) *For primary treatment, filtration and sedimentation should be covered. For secondary treatment, mention the use of oxygen and bacteria (for example, the activated sludge process). Include the removal of heavy metals, phosphates and nitrates by chemical or biological processes*
- a. Primary and Secondary Treatment, and sometimes just Primary Treatment of water is sufficient for drinking water, complete the following table to explain:

	What does it remove?	What are the steps?
Primary Treatment		
Secondary Treatment		

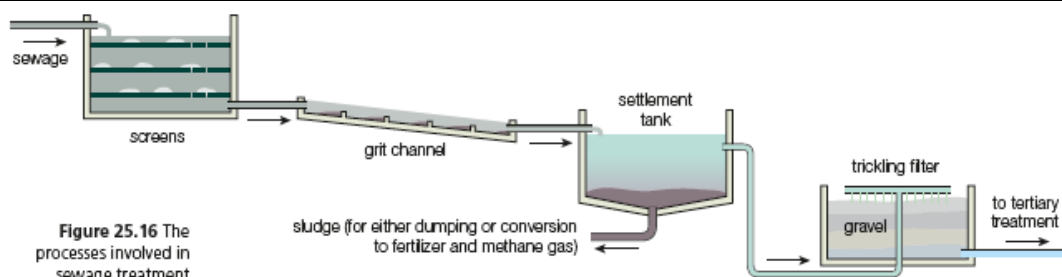


Figure 25.16 The processes involved in sewage treatment

- b. Tertiary Treatment has several other steps to remove certain ions within solution, many have several steps or different possible processes. Explain in the table provided:

Removal of....	Possible Steps and Explanation of each	Appropriate Equations
Ammonium (NH_4^+)		
Nitrates (NO_3^-)		
Phosphates (PO_4^{3-})		
Heavy Metal Ions (Cd, Hg, Ag, etc)		

3. E.6.3 Evaluate the process to obtain fresh water from sea water using multistage distillation and reverse osmosis. (3)

- a. Explain the process of natural osmosis with two solutions (one with salt water, other with pure water):

- b. How is “reverse osmosis” achieved?

- c. Explain thermal desalination and the most common method:

- d. Compare the two methods of removing salt from water:

Method	Advantages	Disadvantages
Reverse Osmosis		
Thermal Desalination		